

Application No. 10/822,340
May 13, 2004
Page 2 of 16

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-20 (canceled).

Claim 24 (new): An apparatus for providing electrical continuity between two objects comprising:

a body with a top surface and a bottom surface and having a thickness extending between the top surface and the bottom surface, a first of said two objects being located at the top surface thereof and a second of said two objects being located at the bottom surface thereof, said body having a plurality of pin receptacles; and

a plurality of pins, each one of said pins being located within a different one of said plurality of receptacles, each pin including a planar center body, a first cantilever beam extending from one portion of said center body at an acute angle relative to said center body, and a second cantilever beam extending from another portion of said center body at an acute angle relative to said center body;

wherein the first cantilever beam of each of said plurality of pins extends over the center body of an adjacent one of the plurality of pins.

Claim 25 (new): The apparatus of claim 24, wherein the first cantilever beam is bent toward the center body of the adjacent one of the plurality of pins and contacts the top surface of the body when the first cantilever beam is depressed by contact with the first of said two objects being located at the upper surface of the body.

Claim 26 (new): The apparatus of claim 24, wherein said first cantilever beam is longer than said second cantilever beam.

Claim 27 (new): The apparatus of claim 24, wherein said plurality of receptacles are arranged in a matrix of rows and columns.

Application No. 10/822,340
May 13, 2004
Page 3 of 16

Claim 28 (new): The apparatus of claim 24, wherein each said pin is freely slidable within the corresponding receptacle, and said center body includes a projection extending from a planar surface of the center body, said projection cooperating with a surface of the receptacle to limit sliding motion of said pin.

Claim 29 (new): The apparatus of claim 24, wherein the first and second cantilever beams have different stiffnesses.

Claim 30 (new): The apparatus of claim 24, wherein each of the plurality of pin receptacles includes a guiding slot arranged such that said pin is slidable within the guiding slot along the thickness of the body both in a direction toward the upper surface of the body and in a direction toward the bottom surface of the body.

Claim 31 (new): The apparatus of claim 30, wherein each of said pins moves within the respective guiding slot along the thickness of the body toward the upper surface of the body in response to said second cantilever beam of said pin being deformed by contacting with the second of said two objects located at the bottom surface of the body.

Claim 32 (new): The apparatus of claim 30, wherein each of said pins moves within the respective guiding slot along the thickness of the body toward the bottom surface of the body in response to said first cantilever beam of said pin being deformed by contacting with the first of said two objects located at the upper surface of the body.

Claim 33 (new): The apparatus of claim 30, wherein the first member of each one of said plurality of pins cooperates with said guiding slot of the corresponding receptacle to guide said pin in only a vertical orientation within said receptacle in the thickness direction of the body.

Application No. 10/822,340
May 13, 2004
Page 4 of 16

Claim 34 (new): The apparatus of claim 30, further comprising at least one stop member for stopping sliding movement of said pin in at least one of the direction toward the upper surface of the body and the direction toward the bottom surface of the body.

Claim 35 (new): The apparatus of claim 30, wherein when the body is compressed by contact with each of the two objects, the first and second cantilever beams are deformed and the pin is moved within the guiding slot in the thickness direction of the body.

Claim 36 (new): The apparatus of claim 24, wherein said center body includes a projection extending from a planar surface of the center body, each one of said pins is freely slidable in a respective one of said plurality of receptacles, and said projection cooperating with a surface of the receptacle to limit sliding motion of said pin.

Claim 37 (new): The apparatus of claim 24, wherein each of said receptacles includes first and second guiding slots, each of said center bodies includes first and second members extending from said center body and coplanar with said center body, and a first member of each one of said plurality of pins is slidably received within said first guiding slot of the corresponding receptacle and a second member of said each one of said plurality of pins is slidably received within said second guiding slot of the corresponding receptacle to loosely guide said pin within said receptacle.

Claim 38 (new): The apparatus of claim 24, wherein each receptacle includes an aperture extending from the top surface to the bottom surface of the body.

Claim 39 (new): The apparatus of claim 24, wherein the first cantilever beam is located closer to the top surface of the body and the second cantilever beam is located closer to the bottom surface of the body.

Application No. 10/822,340
May 13, 2004
Page 5 of 16

Claim 40 (new): The apparatus of claim 24, wherein the apparatus for providing electrical continuity between two objects is a land grid array connector.

Claim 41 (new): The apparatus of claim 40, wherein the land grid array connector includes an integrated circuit packaged therein.

Claim 42 (new): The apparatus of claim 40, wherein the land grid array connector is adapted to provide electrical connection between an electronic component and a printed circuit board.

Claim 43 (new): An apparatus for providing electrical continuity between two objects comprising:

- a body with a top surface and a bottom surface and having a thickness extending between the top surface and the bottom surface, a first of said two objects being located at the top surface thereof and a second of said two objects being located at the bottom surface thereof, said body having a plurality of pin receptacles, each of the plurality of pin receptacles including a guiding slot; and

- a plurality of pins, each one of said pins being located within a different one of said plurality of receptacles, each pin including a planar center body that is slidable within the guiding slot along the thickness of the body in a direction toward the upper surface of the body and in a direction toward the lower surface of the body, a first cantilever beam extending from one portion of said center body at a first acute angle relative to said center body, and a second cantilever beam extending from another portion of said center body at a second acute angle relative to said center body;

wherein the first and second acute angles are different from each other.

Claim 44 (new): The apparatus of claim 43, wherein the first acute angle is about 45° to about 75°.

Application No. 10/822,340
May 13, 2004
Page 6 of 16

Claim 45 (new): The apparatus of claim 43, wherein the first acute angle is about 52°.

Claim 46 (new): The apparatus of claim 43, wherein the second acute angle is about 45° to about 80°.

Claim 47 (new): The apparatus of claim 43, wherein the second acute angle is 64°.

Claim 48 (new): The apparatus of claim 43, wherein the first cantilever beam of each of said plurality of pins extends over the center body of an adjacent one of the plurality of pins.

Claim 49 (new): The apparatus of claim 48, wherein the first cantilever beam is bent toward the center body of the adjacent one of the plurality of pins and contacts the top surface of the body when the first cantilever beam is depressed by contact with the first of said two objects being located at the upper surface of the body.

Claim 50 (new): The apparatus of claim 43, wherein said first cantilever beam is longer than said second cantilever beam.

Claim 51 (new): The apparatus of claim 43, wherein said plurality of receptacles are arranged in a matrix of rows and columns.

Claim 52 (new): The apparatus of claim 43, wherein each said pin is freely slidable within the corresponding receptacle, and said center body includes a projection extending from a planar surface of the center body, said projection cooperating with a surface of the receptacle to limit sliding motion of said pin.

Application No. 10/822,340
May 13, 2004
Page 7 of 16

Claim 53 (new): The apparatus of claim 43, wherein the first and second cantilever beams have different stiffnesses.

Claim 54 (new): The apparatus of claim 43, wherein each of said pins moves within the respective guiding slot along the thickness of the body toward the upper surface of the body in response to said second cantilever beam of said pin being deformed by contacting with the second of said two objects located at the bottom surface of the body.

Claim 55 (new): The apparatus of claim 43, wherein each of said pins moves within the respective guiding slot along the thickness of the body toward the bottom surface of the body in response to said first cantilever beam of said pin being deformed by contacting with the first of said two objects located at the upper surface of the body.

Claim 56 (new): The apparatus of claim 43, wherein the first member of each one of said plurality of pins cooperates with said guiding slot of the corresponding receptacle to guide said pin in only a vertical orientation within said receptacle in the thickness direction of the body.

Claim 57 (new): The apparatus of claim 43, further comprising at least one stop member for stopping sliding movement of said pin in at least one of the direction toward the upper surface of the body and the direction toward the bottom surface of the body.

Claim 58 (new): The apparatus of claim 43, wherein when the body is compressed by contact with each of the two objects, the first and second cantilever beams are deformed and the pin is moved within the guiding slot in the thickness direction of the body.

Claim 59 (new): The apparatus of claim 43, wherein said center body includes a projection extending from a planar surface of the center body, each one of said pins is

Application No. 10/822,340
May 13, 2004
Page 8 of 16

freely slidable in a respective one of said plurality of receptacles, and said projection cooperating with a surface of the receptacle to limit sliding motion of said pin.

Claim 60 (new): The apparatus of claim 43, wherein each of said receptacles includes first and second guiding slots, each of said center bodies includes first and second members extending from said center body and coplanar with said center body, and a first member of each one of said plurality of pins is slidably received within said first guiding slot of the corresponding receptacle and a second member of said each one of said plurality of pins is slidably received within said second guiding slot of the corresponding receptacle to loosely guide said pin within said receptacle.

Claim 61 (new): The apparatus of claim 43, wherein each receptacle includes an aperture extending from the top surface to the bottom surface of the body.

Claim 62 (new): The apparatus of claim 43, wherein the first cantilever beam is located closer to the top surface of the body and the second cantilever beam is located closer to the bottom surface of the body.

Claim 63 (new): The apparatus of claim 43, wherein the apparatus for providing electrical continuity between two objects is a land grid array connector.

Claim 64 (new): The apparatus of claim 63, wherein the land grid array connector includes an integrated circuit packaged therein.

Claim 65 (new): The apparatus of claim 63, wherein the land grid array connector is adapted to provide electrical connection between an electronic component and a printed circuit board.

Claim 66 (new): An apparatus for providing electrical continuity between two

Application No. 10/822,340
May 13, 2004
Page 9 of 16

objects comprising:

a body with a top surface and a bottom surface and having a thickness extending between the top surface and the bottom surface, a first of said two objects being located at the top surface thereof and a second of said two objects being located at the bottom surface thereof, said body having a plurality of pin receptacles; and

a plurality of pins, each one of said pins being located within a different one of said plurality of receptacles, each pin including a planar center body, a first cantilever beam extending from one portion of said center body at an acute angle relative to said center body, and a second cantilever beam extending from another portion of said center body at an acute angle relative to said center body;

wherein the first cantilever beam is less resistant to bending than the second cantilever beam.

Claim 67 (new): The apparatus of claim 66, wherein the acute angles of the first and second cantilever beam are different from each other.

Claim 68 (new): The apparatus of claim 66, wherein the acute angle of the first cantilever beam is less than the acute angle of the second cantilever beam.

Claim 69 (new): The apparatus of claim 66, wherein the first cantilever beam of each of said plurality of pins extends over the center body of an adjacent one of the plurality of pins.

Claim 70 (new): The apparatus of claim 69, wherein the first cantilever beam is bent toward the center body of the adjacent one of the plurality of pins and contacts the top surface of the body when the first cantilever beam is depressed by contact with the first of said two objects being located at the upper surface of the body.

Claim 71 (new): The apparatus of claim 66, wherein said first cantilever beam is

Application No. 10/822,340
May 13, 2004
Page 10 of 16

longer than said second cantilever beam.

Claim 72 (new): The apparatus of claim 66, wherein said plurality of receptacles are arranged in a matrix of rows and columns.

Claim 73 (new): The apparatus of claim 66, wherein each said pin is freely slidable within the corresponding receptacle, and said center body includes a projection extending from a planar surface of the center body, said projection cooperating with a surface of the receptacle to limit sliding motion of said pin.

Claim 74 (new): The apparatus of claim 66, wherein the first and second cantilever beams have different stiffnesses.

Claim 75 (new): The apparatus of claim 66, wherein each of the plurality of pin receptacles includes a guiding slot arranged such that said pin is slidable within the guiding slot along the thickness of the body both in a direction toward the upper surface of the body and in a direction toward the bottom surface of the body.

Claim 76 (new): The apparatus of claim 75, wherein each of said pins moves within the respective guiding slot along the thickness of the body toward the upper surface of the body in response to said second cantilever beam of said pin being deformed by contacting with the second of said two objects located at the bottom surface of the body.

Claim 77 (new): The apparatus of claim 75, wherein each of said pins moves within the respective guiding slot along the thickness of the body toward the bottom surface of the body in response to said first cantilever beam of said pin being deformed by contacting with the first of said two objects located at the upper surface of the body.

Application No. 10/822,340
May 13, 2004
Page 11 of 16

Claim 78 (new): The apparatus of claim 75, wherein the first member of each one of said plurality of pins cooperates with said guiding slot of the corresponding receptacle to guide said pin in only a vertical orientation within said receptacle in the thickness direction of the body.

Claim 79 (new): The apparatus of claim 75, further comprising at least one stop member for stopping sliding movement of said pin in at least one of the direction toward the upper surface of the body and the direction toward the bottom surface of the body.

Claim 80 (new): The apparatus of claim 75, wherein when the body is compressed by contact with each of the two objects, the first and second cantilever beams are deformed and the pin is moved within the guiding slot in the thickness direction of the body.

Claim 81 (new): The apparatus of claim 66, wherein said center body includes a projection extending from a planar surface of the center body, each one of said pins is freely slidable in a respective one of said plurality of receptacles, and said projection cooperating with a surface of the receptacle to limit sliding motion of said pin.

Claim 82 (new): The apparatus of claim 66, wherein each of said receptacles includes first and second guiding slots, each of said center bodies includes first and second members extending from said center body and coplanar with said center body, and a first member of each one of said plurality of pins is slidably received within said first guiding slot of the corresponding receptacle and a second member of said each one of said plurality of pins is slidably received within said second guiding slot of the corresponding receptacle to loosely guide said pin within said receptacle.

Claim 83 (new): The apparatus of claim 66, wherein each receptacle includes an aperture extending from the top surface to the bottom surface of the body.

Application No. 10/822,340
May 13, 2004
Page 12 of 16

Claim 84 (new): The apparatus of claim 66, wherein the first cantilever beam is located closer to the top surface of the body and the second cantilever beam is located closer to the bottom surface of the body.

Claim 85 (new): The apparatus of claim 66, wherein the apparatus for providing electrical continuity between two objects is a land grid array connector.

Claim 86 (new): The apparatus of claim 85, wherein the land grid array connector includes an integrated circuit packaged therein.

Claim 87 (new): The apparatus of claim 85, wherein the land grid array connector is adapted to provide electrical connection between an electronic component and a printed circuit board.

Claim 88 (new): An apparatus for providing electrical continuity between two objects comprising:

a body with a top surface and a bottom surface and having a thickness extending between the top surface and the bottom surface, a first of said two objects being located at the top surface thereof and a second of said two objects being located at the bottom surface thereof, said body having a plurality of pin receptacles each including a guiding slot; and

a plurality of pins, each one of said pins being located within a different one of said plurality of receptacles, each pin including a planar center body, a first cantilever beam extending from one portion of said center body at an acute angle relative to said center body, and a second cantilever beam extending from another portion of said center body at an acute angle relative to said center body;

wherein each of said pins is slidable within the guiding slot along the thickness of the body, and when the first and second cantilever beams are contacted by the first and

Application No. 10/822,340
May 13, 2004
Page 13 of 16

second objects, respectively, the first cantilever beam is deflected by a first amount and the second beam is deflected by a second amount that is less than the first amount and causes the pin to slide within the guiding slot along the thickness of the body in a direction toward the top surface of the body.

Claim 89 (new): The apparatus according to claim 88, wherein the acute angles of the first and second cantilever beam are different from each other.

Claim 90 (new): The apparatus of claim 88, wherein the acute angle of the first cantilever beam is less than the acute angle of the second cantilever beam.

Claim 91 (new): The apparatus of claim 88, wherein the first cantilever beam of each of said plurality of pins extends over the center body of an adjacent one of the plurality of pins.

Claim 92 (new): The apparatus of claim 91, wherein the first cantilever beam is bent toward the center body of the adjacent one of the plurality of pins and contacts the top surface of the body when the first cantilever beam is depressed by contact with the first of said two objects being located at the upper surface of the body.

Claim 93 (new): The apparatus of claim 88, wherein said first cantilever beam is longer than said second cantilever beam.

Claim 94 (new): The apparatus of claim 88, wherein said plurality of receptacles are arranged in a matrix of rows and columns.

Claim 95 (new): The apparatus of claim 88, wherein each said pin is freely slidable within the corresponding receptacle, and said center body includes a projection extending

Application No. 10/822,340
May 13, 2004
Page 14 of 16

from a planar surface of the center body, said projection cooperating with a surface of the receptacle to limit sliding motion of said pin.

Claim 96 (new): The apparatus of claim 88, wherein the first and second cantilever beams have different stiffnesses.

Claim 97 (new): The apparatus of claim 88, wherein each of said pins moves within the respective guiding slot along the thickness of the body toward the upper surface of the body in response to said second cantilever beam of said pin being deformed by contacting with the second of said two objects located at the bottom surface of the body.

Claim 98 (new): The apparatus of claim 88, wherein each of said pins moves within the respective guiding slot along the thickness of the body toward the bottom surface of the body in response to said first cantilever beam of said pin being deformed by contacting with the first of said two objects located at the upper surface of the body.

Claim 99 (new): The apparatus of claim 88, wherein the first member of each one of said plurality of pins cooperates with said guiding slot of the corresponding receptacle to guide said pin in only a vertical orientation within said receptacle in the thickness direction of the body.

Claim 100 (new): The apparatus of claim 88, further comprising at least one stop member for stopping sliding movement of said pin in at least one of the direction toward the upper surface of the body and the direction toward the bottom surface of the body.

Claim 101 (new): The apparatus of claim 88, wherein said center body includes a projection extending from a planar surface of the center body, each one of said pins is freely slidable in a respective one of said plurality of receptacles, and said projection cooperating with a surface of the receptacle to limit sliding motion of said pin.

Application No. 10/822,340
May 13, 2004
Page 15 of 16

Claim 102 (new): The apparatus of claim 88, wherein each of said receptacles includes first and second guiding slots, each of said center bodies includes first and second members extending from said center body and coplanar with said center body, and a first member of each one of said plurality of pins is slidably received within said first guiding slot of the corresponding receptacle and a second member of said each one of said plurality of pins is slidably received within said second guiding slot of the corresponding receptacle to loosely guide said pin within said receptacle.

Claim 103 (new): The apparatus of claim 88, wherein each receptacle includes an aperture extending from the top surface to the bottom surface of the body.

Claim 104 (new): The apparatus of claim 88, wherein the first cantilever beam is located closer to the top surface of the body and the second cantilever beam is located closer to the bottom surface of the body.

Claim 105 (new): The apparatus of claim 88, wherein the apparatus for providing electrical continuity between two objects is a land grid array connector.

Claim 106 (new): The apparatus of claim 105, wherein the land grid array connector includes an integrated circuit packaged therein.

Claim 107 (new): The apparatus of claim 105, wherein the land grid array connector is adapted to provide electrical connection between an electronic component and a printed circuit board.